Maldistribution in airewater heat pump evaporators. Part 1: Effects on evaporator, heat pump and system level - DTU Orbit (09/11/2017)

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This paper presents an approach to quantify the effect of evaporator maldistribution onoperating costs of air-water heat pumps. In the proposed simulation model maldistributionis induced by two parameters describing refrigerant phase and air flow distribution.Annual operating costs are calculated based on heat pump performance at distinct operatingconditions. Results show that percentage increase of operating costs is similar for thethree considered climate zones, even though the effect of maldistribution on heat pumpperformance varies with operating conditions. Differences in terms of absolute cost increasefor the climate zones arise mainly due to a varying number of operating hours.Absolute cost increase is considerable in the average and especially colder climate zoneand can only partly be reduced by enlarging the evaporator.

General information

State: Published
Organisations: Department of Mechanical Engineering, Thermal Energy, Danfoss A/S, KTH - Royal Institute of Technology
Authors: Mader, G. (Ekstern), Palm, B. (Ekstern), Elmegaard, B. (Intern)
Pages: 207–216
Publication date: 2015
Main Research Area: Technical/natural sciences

Publication information

Journal: International Journal of Refrigeration
Volume: 50
ISSN (Print): 0140-7007
Ratings:

BFI (2017): BFI-level 1
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 3.06 SJR 1.344 SNIP 1.598
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 1.396 SNIP 1.537 CiteScore 2.44
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 1.667 SNIP 2.117 CiteScore 2.6
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 1.461 SNIP 1.979 CiteScore 2.25
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): SJR 1.426 SNIP 1.908 CiteScore 2.09
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 1
Scopus rating (2011): SJR 1.308 SNIP 2.129 CiteScore 2.2
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
BFI (2010): BFI-level 1
Scopus rating (2010): SJR 1.372 SNIP 1.786
Web of Science (2010): Indexed yes
BFI (2009): BFI-level 1
Scopus rating (2009): SJR 1.569 SNIP 1.954
Web of Science (2009): Indexed yes
BFI (2008): BFI-level 1
Scopus rating (2008): SJR 1.309 SNIP 1.737
Web of Science (2008): Indexed yes

Scopus rating (2007): SJR 0.841 SNIP 1.646
Scopus rating (2006): SJR 1.5 SNIP 1.629
Scopus rating (2005): SJR 1.409 SNIP 1.718
Web of Science (2005): Indexed yes
Scopus rating (2004): SJR 1.193 SNIP 1.933
Scopus rating (2003): SJR 1.241 SNIP 1.542
Scopus rating (2002): SJR 1.592 SNIP 1.807
Scopus rating (2001): SJR 1.775 SNIP 1.86
Web of Science (2001): Indexed yes
Scopus rating (2000): SJR 1.001 SNIP 1.279
Scopus rating (1999): SJR 0.824 SNIP 1.213
Original language: English
Heat pump, Maldistribution, Annual performance, System modeling, Operating costs
DOIs:
10.1016/j.ijrefrig.2014.07.006
Publication: Research - peer-review › Journal article – Annual report year: 2014